

NSLS Timing System

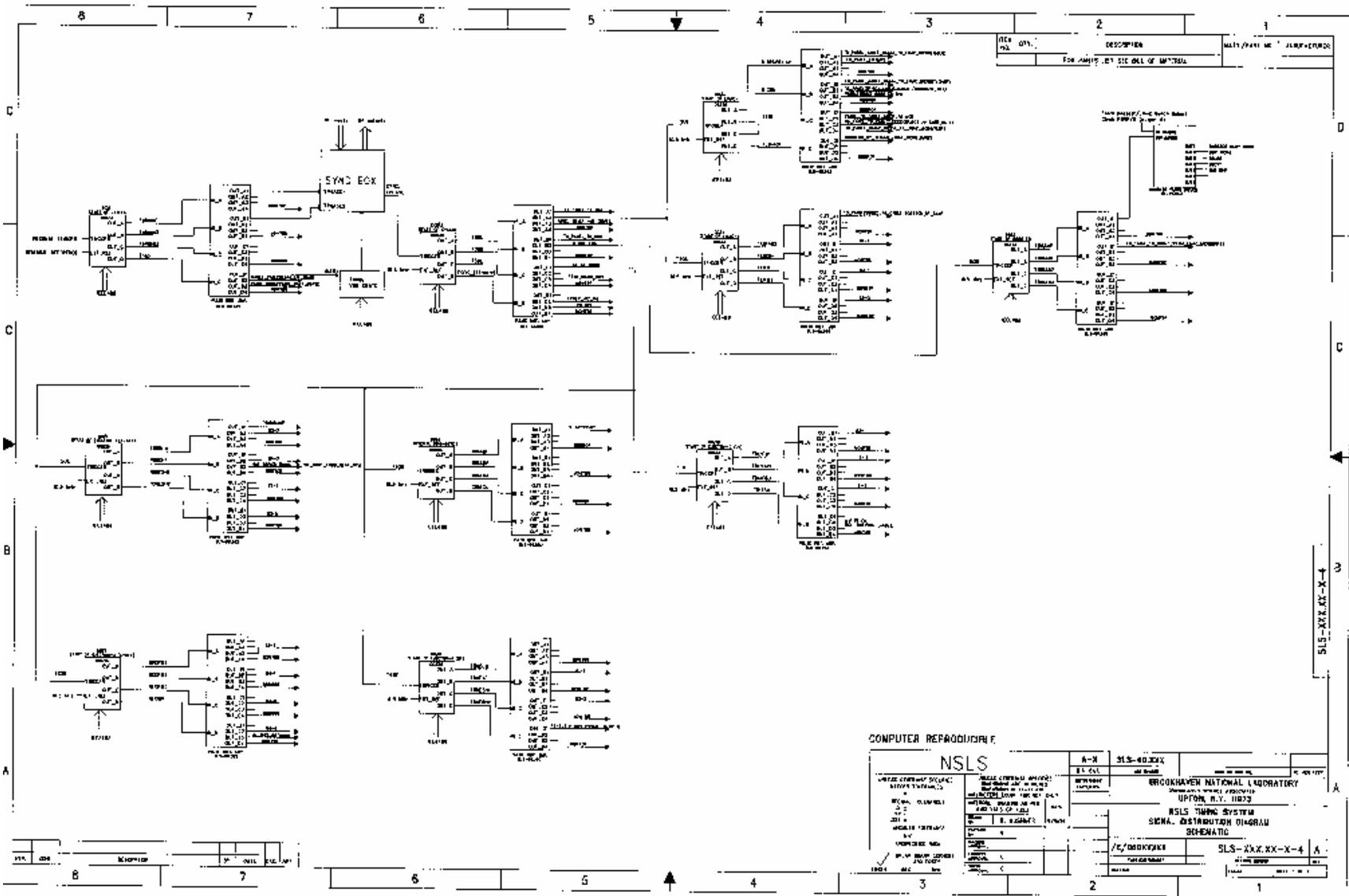
-Operational Overview

-Shortcomings

-Current Project

Timing System Will:

- Maintain synchronization with 60 Hz line**
- Maintain synchronization with bunch 1 of both rings**
- Provide means to fill rings with any bunch pattern**
- Provide revolution clock signals for distribution**
- Provide trigger signals to downstream systems such as kickers**

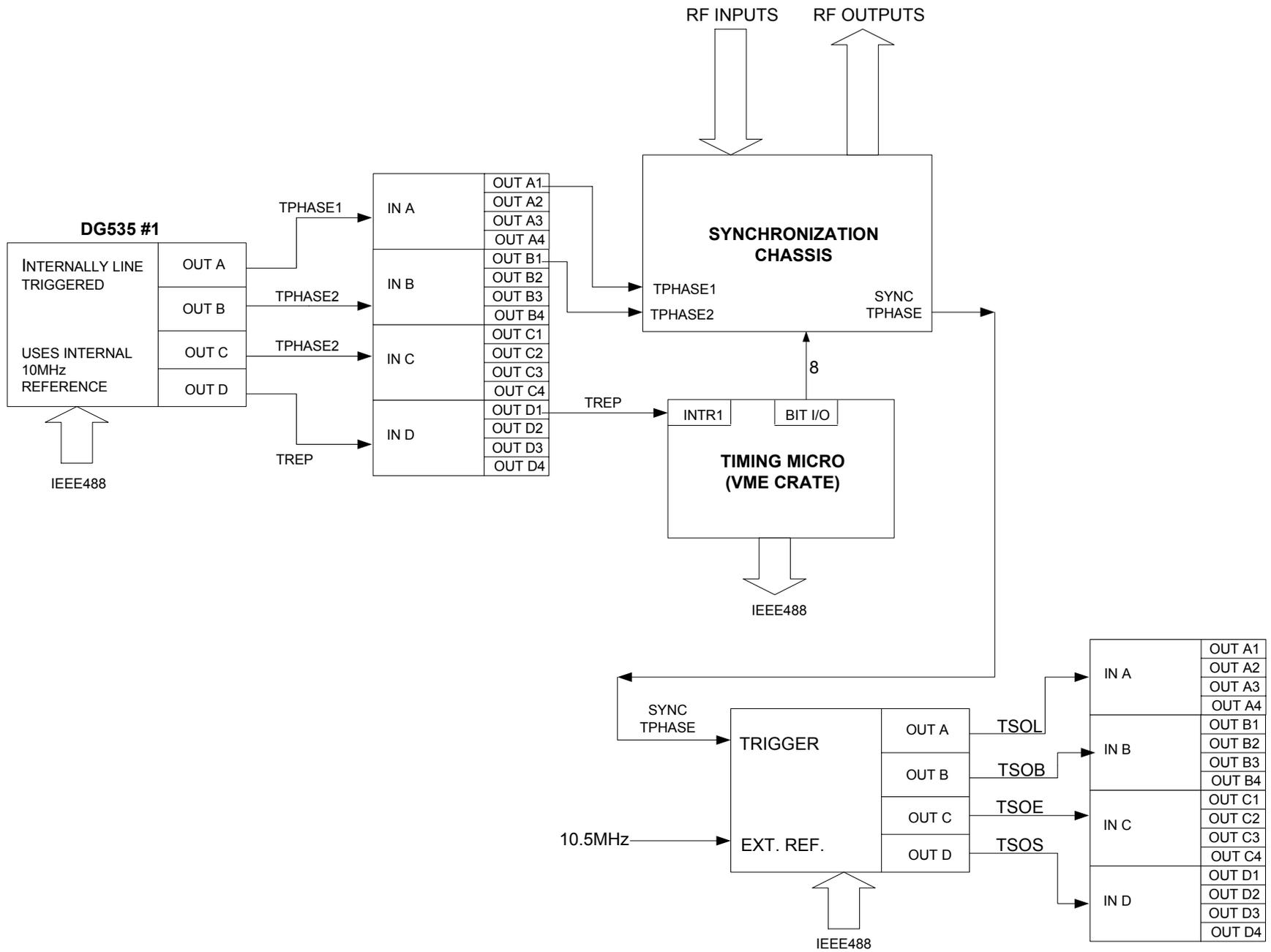


ITEM NO.	DESCRIPTION	QUANTITY	UNIT	REVISION
1	FOR ANALYSIS OF SIGNAL DISTRIBUTION			

COMPUTER REPRODUCTION

NSLS NATIONAL SYNCHROTRON LIGHT SOURCE BROOKHAVEN NATIONAL LABORATORY UPTON, N.Y. 11973		SLS-6030X REV. 10/73
NSLS TIMING SYSTEM SIGNAL DISTRIBUTION DIAGRAM SCHEMATIC		SLS-XX.XX.XX-4 A
DATE: 10/73 DRAWN BY: J. J. ... CHECKED BY: ... APPROVED BY: ...	TITLE: NSLS TIMING SYSTEM SIGNAL DISTRIBUTION DIAGRAM SCHEMATIC	PROJECT: NSLS

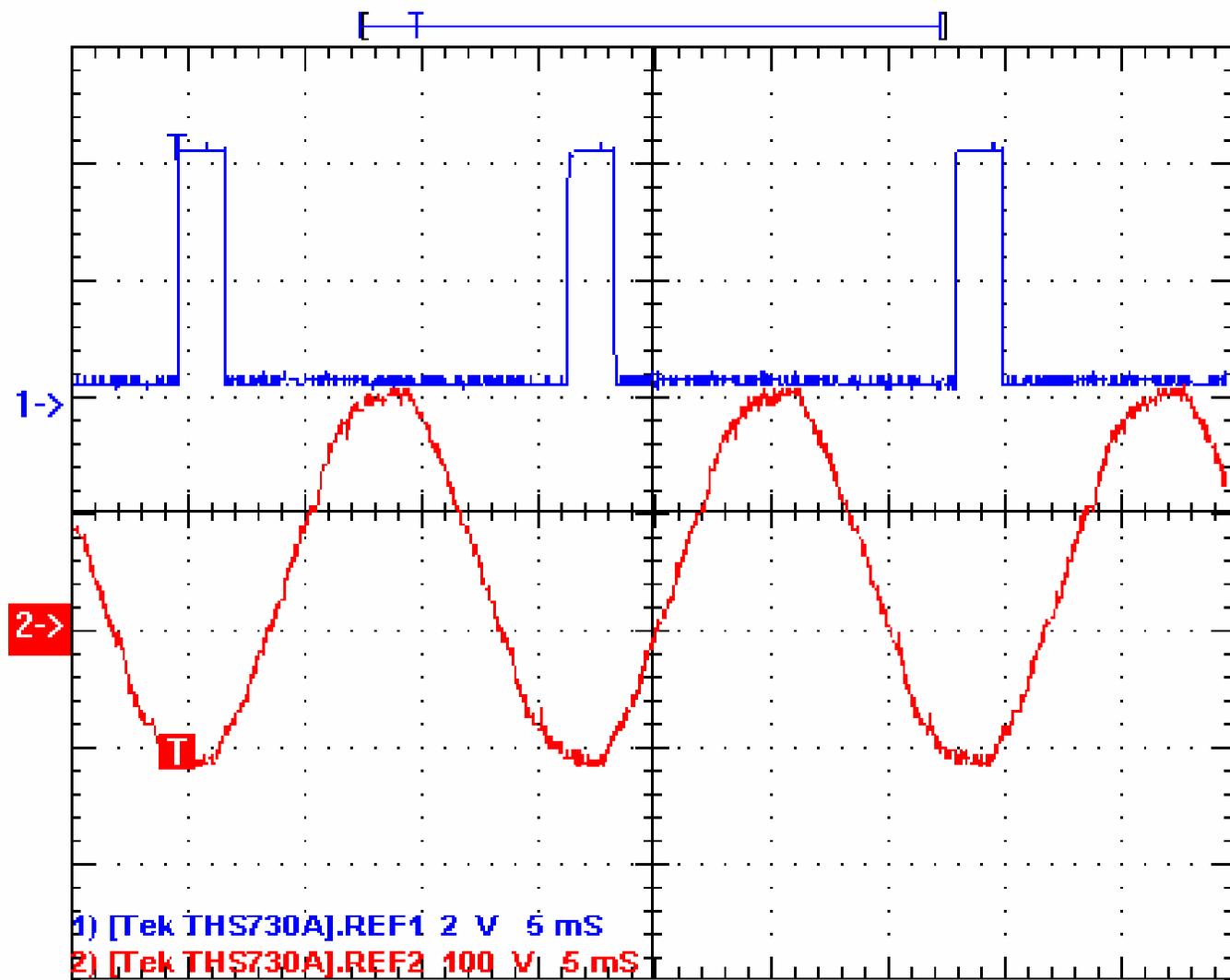
SLS-XX.XX.XX-4



Partial Block Diagram of Timing System

TREP

- Sets overall rep rate of injection
- Interrupts the Timing Micro to set up new data
- Triggered off of 60 Hz line
- Pretune device currently set to 831.50 ms (50 cnts)
- DG535 is a non-retriggerable one-shot
 - New triggers are ignored until the longest delay is complete
 - Causes the "RATE" light to go on



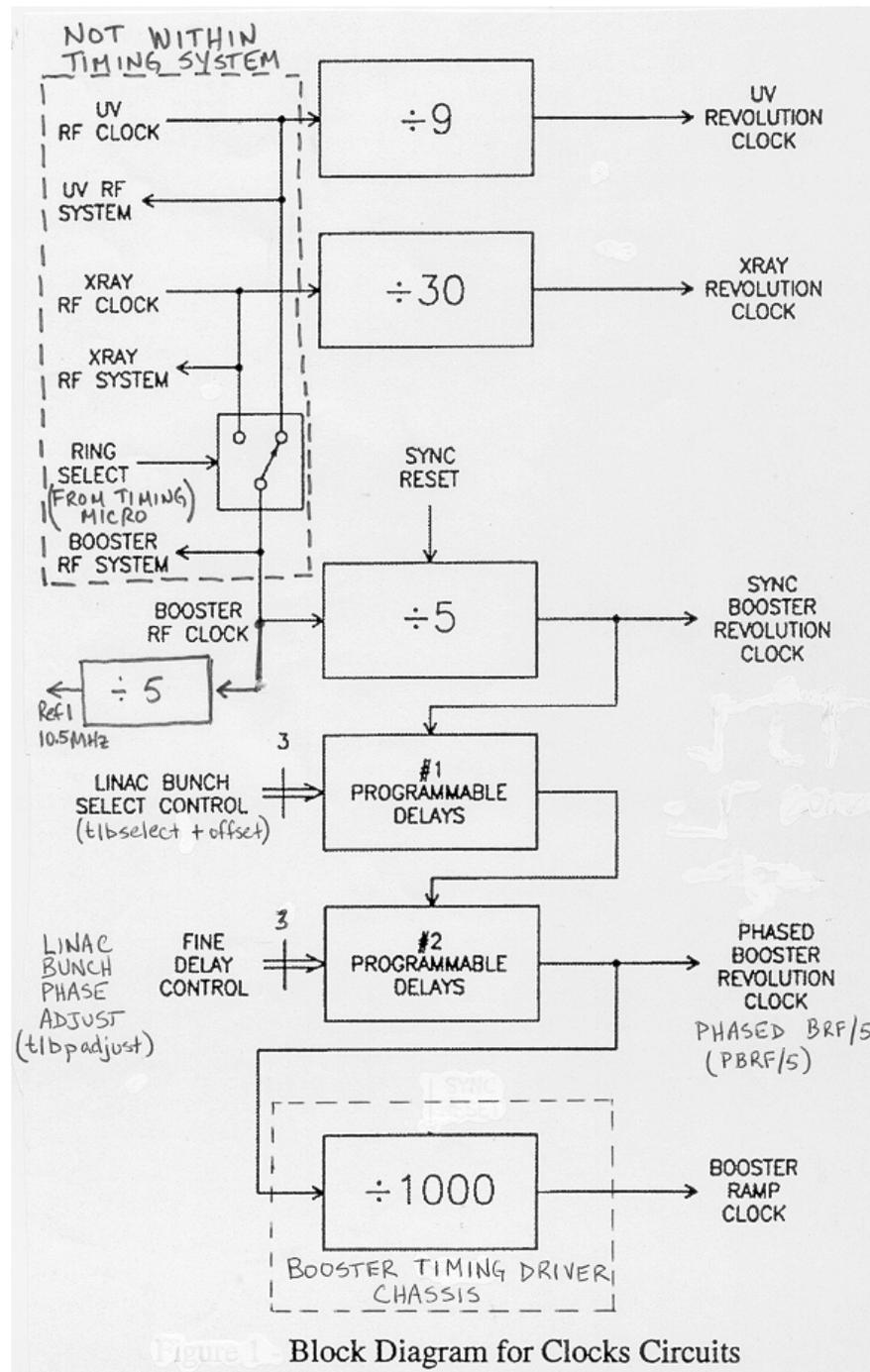


Figure 1 - Block Diagram for Clocks Circuits

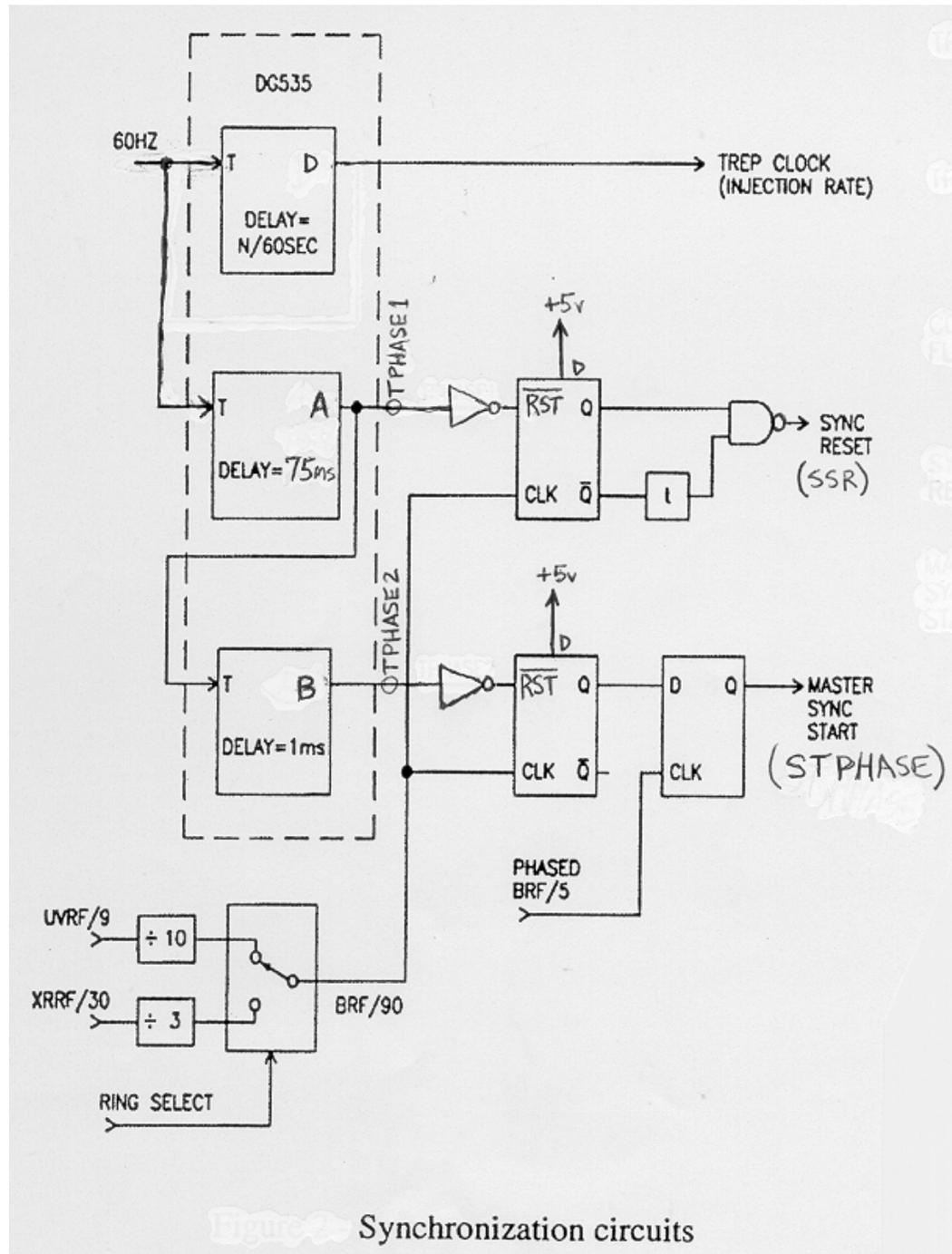
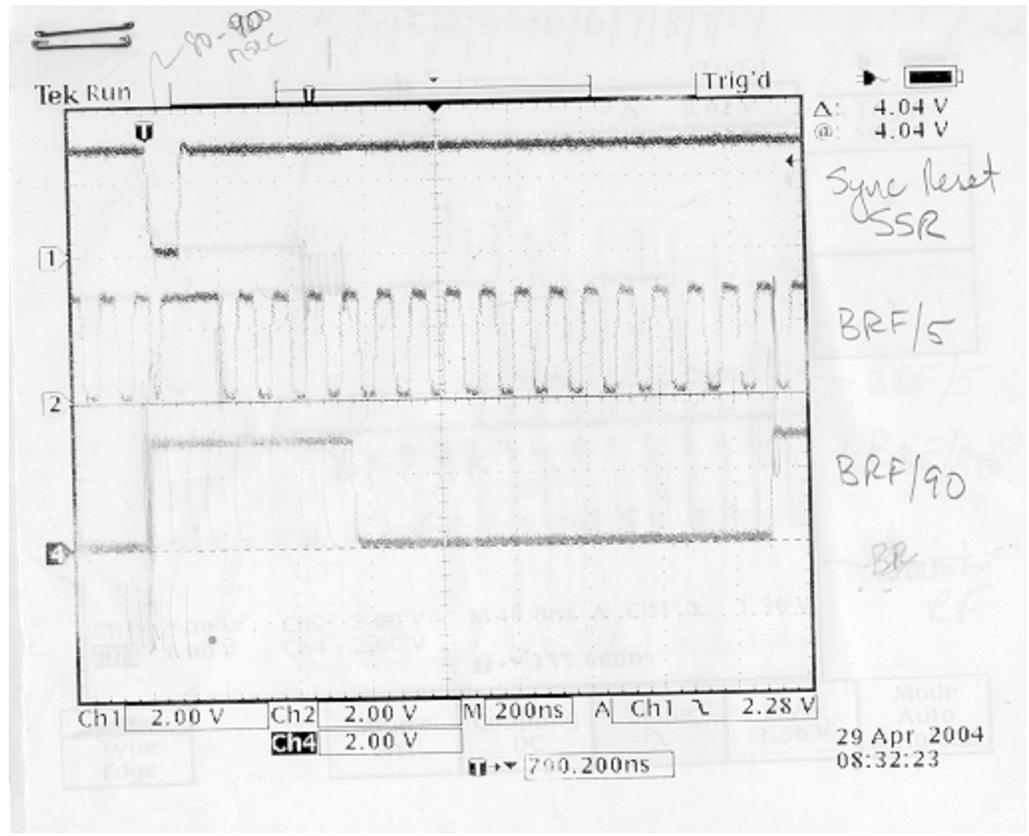
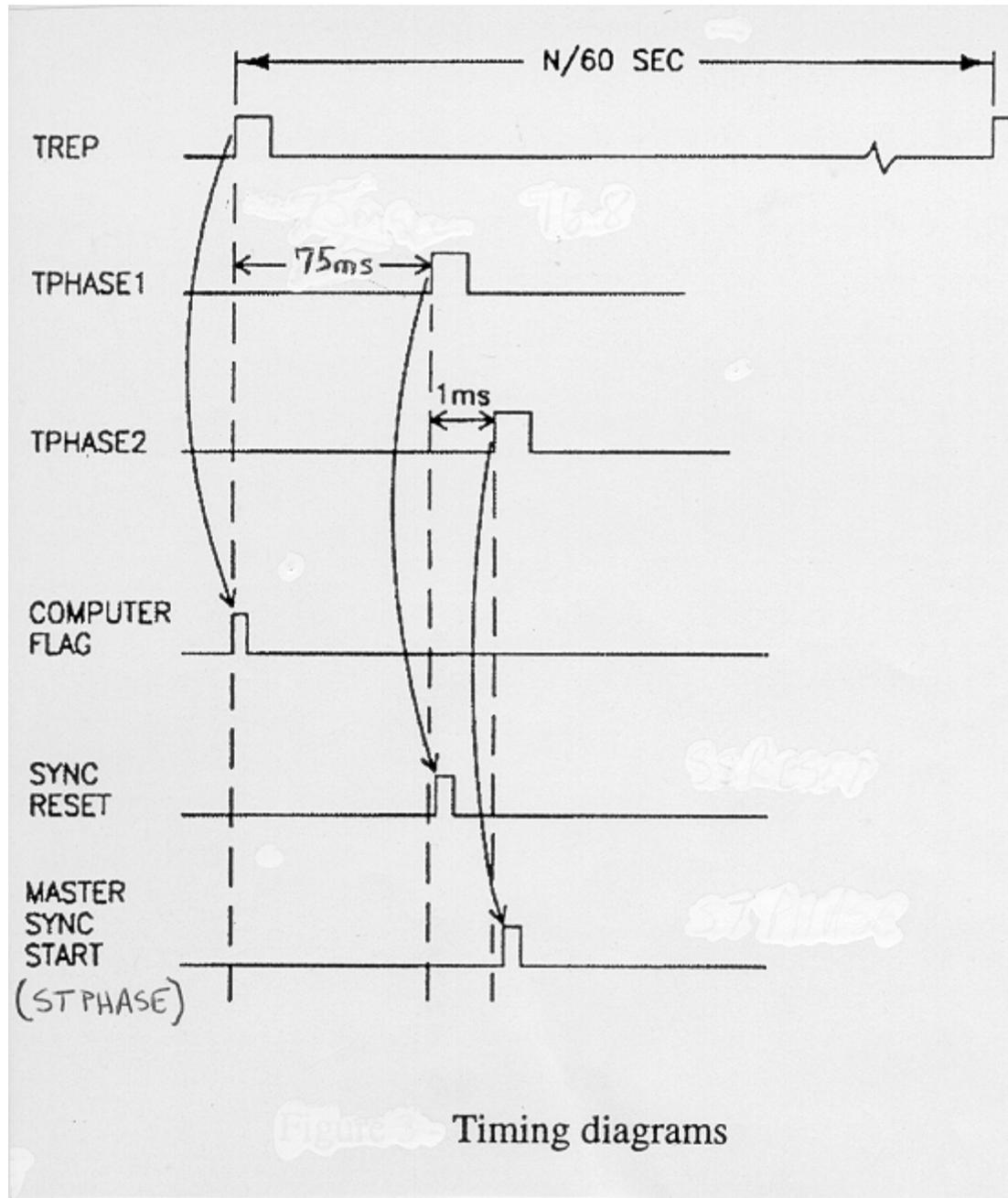
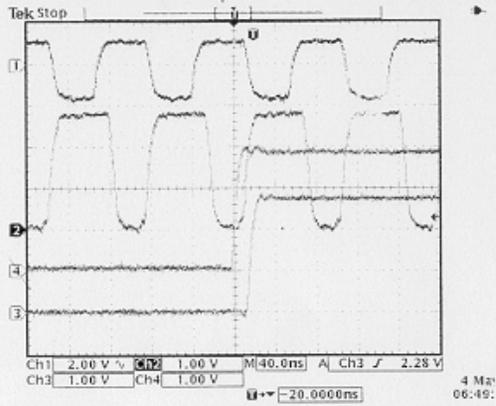


Figure 2 Synchronization circuits

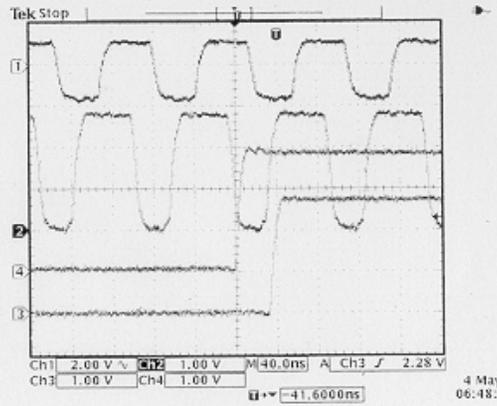




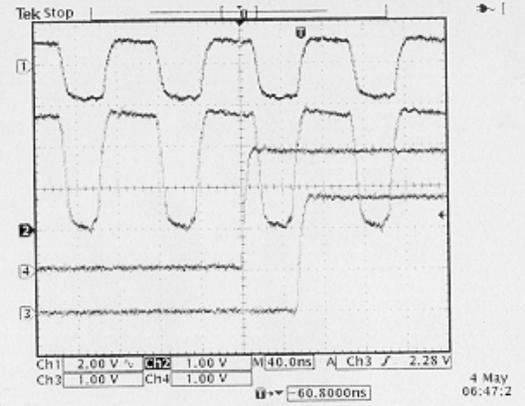
X-RAY BUNCH 2 000



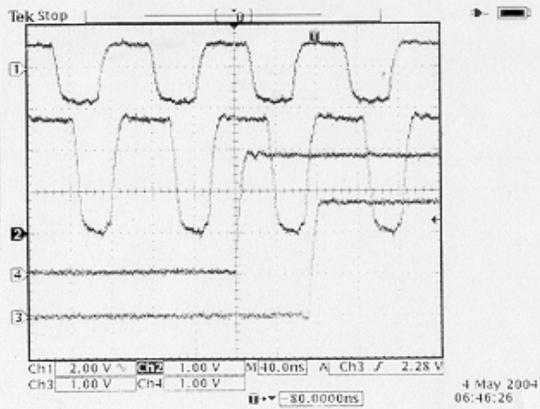
X-RAY BUNCH 3 001



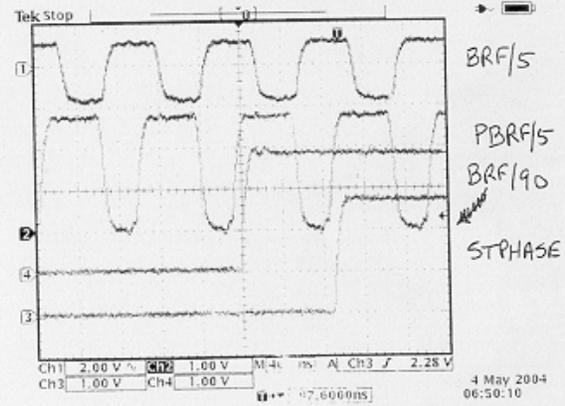
X-RAY BUNCH 4 010



X-RAY BUNCH 5 011



X-RAY BUNCH 1 100



5-1-2-3-4

SYNC TPHASE

TSOL

TLBPMDELAY (TLKLY?)

TLGUN TLRF

TLDIAG1

TLDIAG2 TLBISH

TLIFB1 TLIFB2

TSOB

TBRAMP TBDIAG1

TBDIAG2 TBDIAG3

TSOE

TBXBLW TBXEKF

TBXESH1 TBXESH2

TBXIFB1 TBXIFB2

TBXIFB3 TBXISH

TBUBLW TBUEKF

TBUESH1 TBUESH2

TBUIFB1 TBUIFB2

TBUIFB3 TBUISH

GDIAG1, 2, 3, 4

X-RAY MULTIBUNCH TABLE

X-Ray Bunch #	tsoelo Offset (LS-nsec)	tlbselect Offset #	X-Ray Bunch #	tsoelo Offset (LS-nsec)	tlbselect Offset #
1	0	0	16	300	0
2	0	1	17	300	1
3	0	2	18	300	2
4	0	3	19	300	3
5	0	4	20	300	4
6	100	0	21	400	0
7	100	1	22	400	1
8	100	2	23	400	2
9	100	3	24	400	3
10	100	4	25	400	4
11	200	0	26	500	0
12	200	1	27	500	1
13	200	2	28	500	2
14	200	3	29	500	3
15	200	4	30	500	4

tsoelo = 10 LS-nsec/count
tsoehi = 0.1 LS-msec/count

VUV MULTIBUNCH TABLE	
VUV Bunch #	tsoelo Offset (LS-nsec)
1	0
2	200
3	400
4	600
5	800
6	1000
7	1200
8	1400
9	1600

AS AN EXAMPLE

If the desired X-ray pattern is: 111111000000111111000000111111

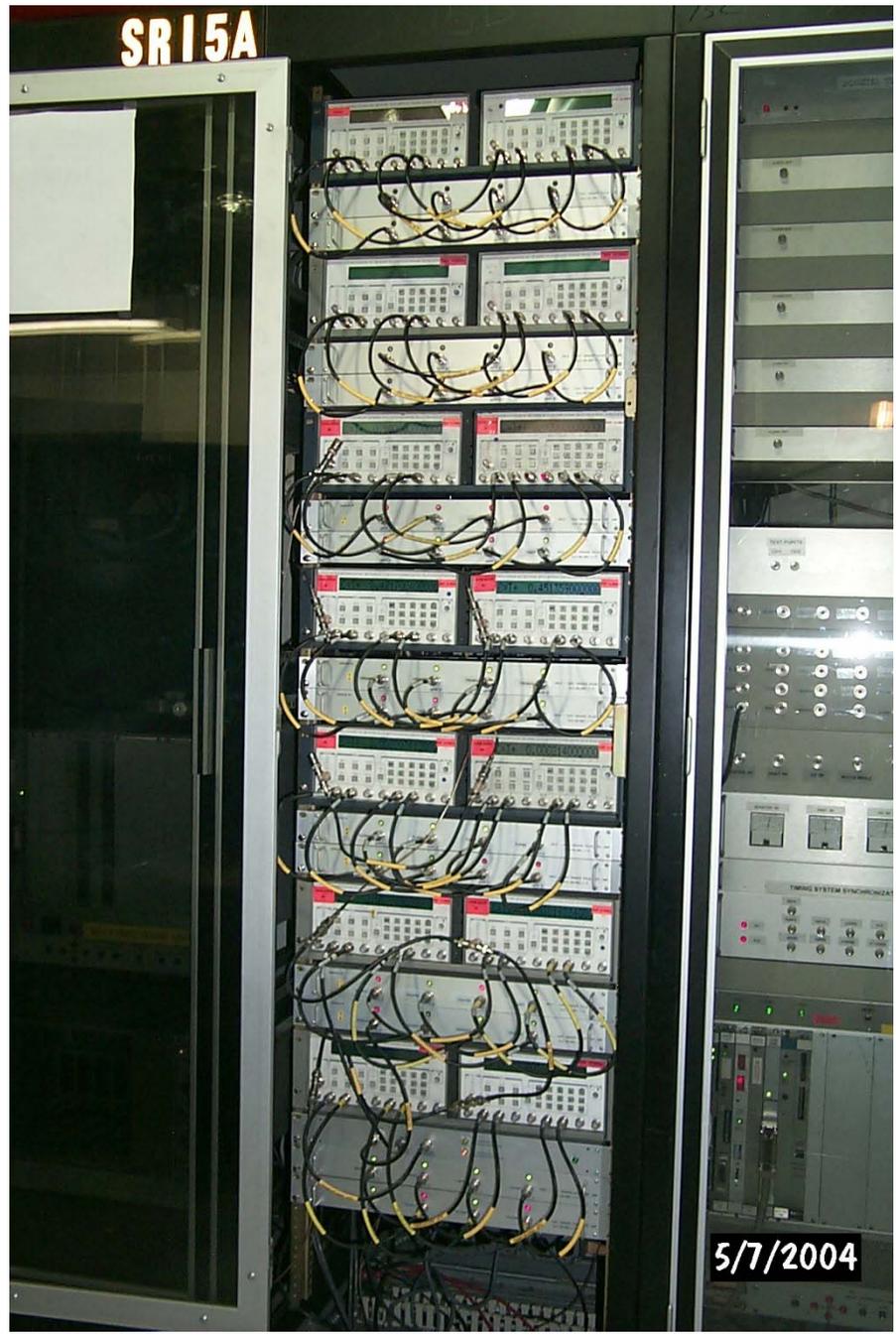
Then the sequence for the tsoelo in LS-nsec and tlselect would be:

0,0	0,1	0,2	0,3	0,4	10,0	20,2	20,3	20,4
30,0	30,1	30,2	40,4	50,0	50,1	50,2	50,3	50,4



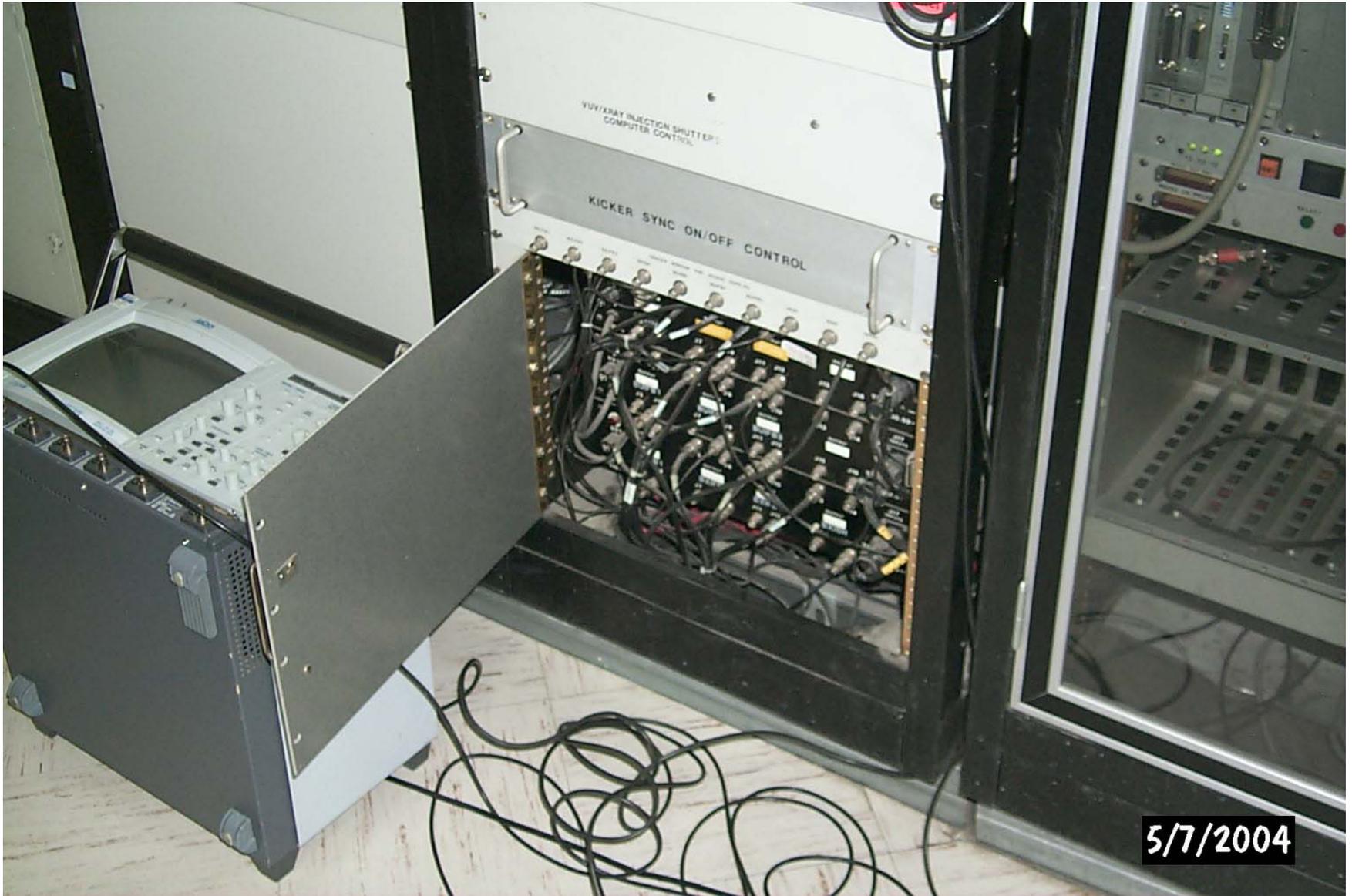
SR11B

5/7/2004

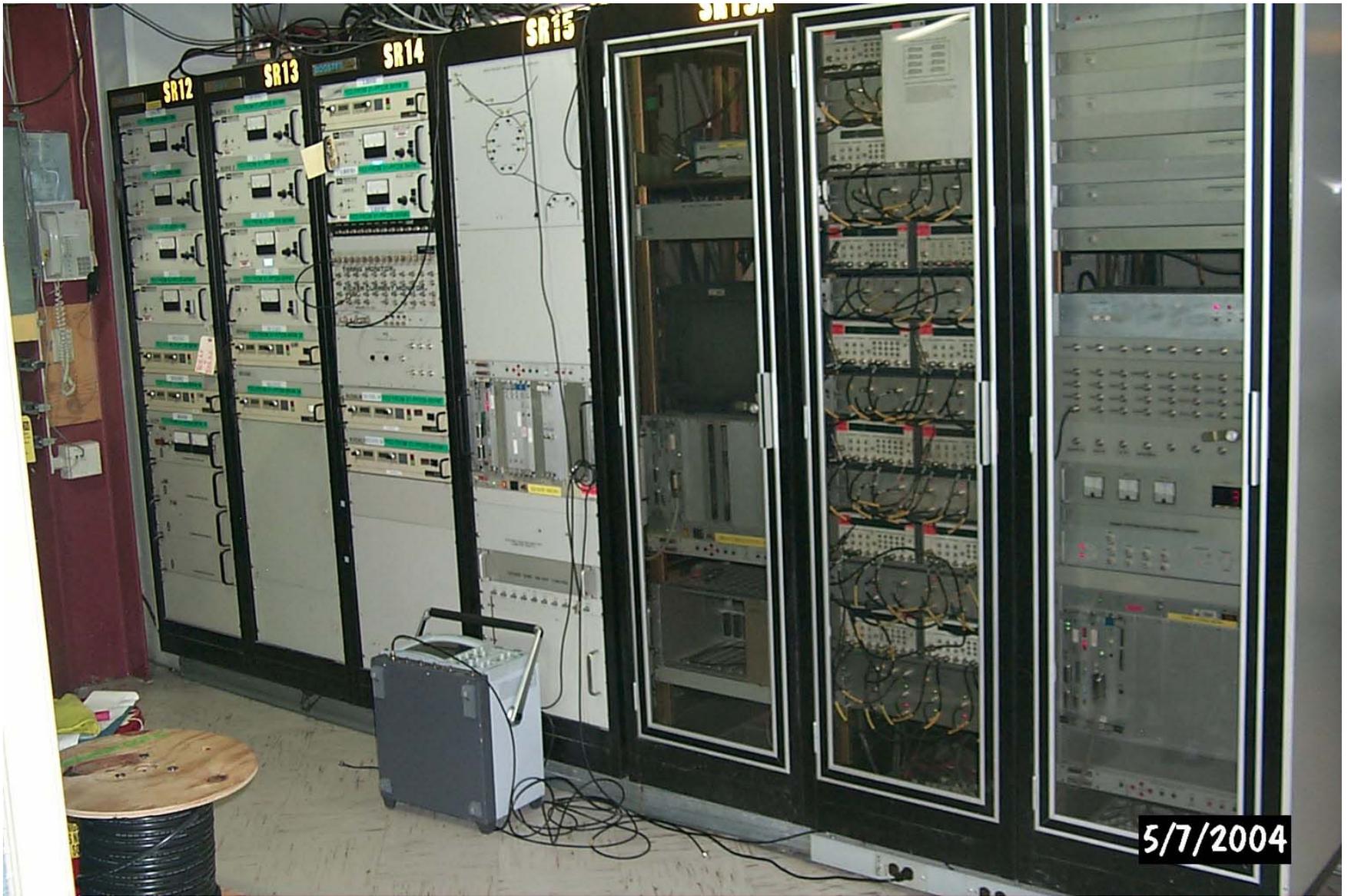


SRI 5A

5/7/2004



5/7/2004



Approved Project 04EB000006 “UPGRADE TIMING SYSTEM”

- New Synchronization Chassis will use properly documented pc boards**
- New Synchronization Chassis will use up-to-date parts and Altera Programmable Logic Arrays, which will:**
 - Reduce parts count**
 - Reduce complexity of pc board**
 - Make changes easier to accomplish**
- Look into removal of Hammer Driver stage**